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U.S. Patent Granted

The United States of America



The Commissioner of Patents and Trademarks

Has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.

Therefore, this

United States Patent

Grants to the person(s) having title to this patent the right to exclude others from making, using, offering for sale, or selling the invention throughout the United States of America or importing the invention into the United States of America for the term set forth below, subject to the payment of maintenance fees as provided by law.

If this application was filed prior to June 8, 1995, the term of this patent is the longer of seventeen years from the date of grant of this patent or twenty years from the earliest effective U.S. filing date of the application, subject to any statutory extension.

If this application was filed on or after June 8, 1995, the term of this patent is twenty years from the U.S. filing date, subject to any statutory extension. If the application contains a specific reference to an earlier filed application or applications under 35 U.S.C. 120, 121 or 365(c), the term of the patent is twenty years from the date on which the earliest application was filed, subject to any statutory extension.

J. Todd Johnson

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10/25/01



US005978160A

United States Patent [19]

Koiwai et al.

[11] **Patent Number:** 5,978,160[45] **Date of Patent:** Nov. 2, 1999

[54] **LENS BARREL HAVING A FLARE DIAPHRAGM WHICH CAN ADVANCE INTO AND RETREAT FROM THE OPTICAL PATH TO ELIMINATE DELETERIOUS LIGHT RESULTING FROM MOVEMENT OF THE LENS**

[75] **Inventors:** Tamotsu Koiwai, Akiruno; Tatsuya Suzuki, Tokyo, both of Japan

[73] **Assignee:** Olympus Optical Co., Ltd., Tokyo, Japan

[21] **Appl. No.:** 08/979,642

[22] **Filed:** Nov. 26, 1997

[30] **Foreign Application Priority Data**

Nov. 28, 1996 [JP] Japan H8-326822

[51] **Int. Cl.⁶** G02B 7/02; G02B 15/14; G02B 9/00

[52] **U.S. Cl.** 359/822; 359/704; 359/739; 359/740

[58] **Field of Search** 359/822, 704, 359/739, 740

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Assistant Examiner—Michael A. Lucas
Attorney, Agent, or Firm—Louis Weinstein

[57] **ABSTRACT**

In a lens barrel, a flare diaphragm is disposed on an optical path of lenses or in the vicinity thereof such that the flare diaphragm can advance into and retreat from the optical path for cutting deleterious light corresponding to the lenses moving in the direction of the optical axis. This lens barrel can reliably cut deleterious light flux in a simple structure.

23 Claims, 15 Drawing Sheets